

Meromorphic Functions And Analytic Curves

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Theory of Entire and Meromorphic Functions Guan-Hou Zhang 1993 This book was originally written in Chinese in 1986 by the noted complex analyst Zhang Guan-Hou, who was a research fellow at the Academia Sinica. The book

provides a basic introduction to the development of the theory of entire and meromorphic functions from the 1950s to the early 1980s. After an opening chapter introducing fundamentals of Nevanlinna's value distribution theory, this book discusses various relationships

among and developments of three central concepts: deficient value, asymptotic value, and singular direction. This book describes many significant results and research directions developed by Zhang and other Chinese complex analysts and published in Chinese mathematical journals. A comprehensive and self-contained reference, this book is useful for graduate students and researchers in complex analysis.

Meromorphic Functions and Analytic Curves
Hermann Weyl 1992

Analytic Functions Rolf Nevanlinna 2013-12-20

The present monograph on analytic functions coincides to a large extent with the presentation of the modern theory of single-valued analytic functions given in my earlier works "Le theoreme de Picard Borel et la theorie des fonctions meromorphes" (Paris: Gauthier-Villars 1929) and "Eindeutige analytische Funktionen" (Die Grundlehren der mathematischen Wissenschaften in Einzeldarstellungen, Vol 46, 1: edition Berlin: Springer 1936, 2nd edition Berlin-Göttingen-

Heidelberg Springer 1953). In these presentations I have strived to make the individual result and their proofs readily understandable and to treat them in the light of certain guiding principles in a unified way. A decisive step in this direction within the theory of entire and meromorphic functions consisted in replacing the classical representation of these functions through canonical products with more general tools from the potential theory (Green's formula and especially the Poisson-Jensen formula). On this foundation it was possible to introduce the quantities (the characteristic the proximity and the counting functions) which are definitive for the

Graphs on Surfaces and Their Applications Sergei K. Lando 2013-04-17 Graphs drawn on two-dimensional surfaces have always attracted researchers by their beauty and by the variety of difficult questions to which they give rise. The theory of such embedded graphs, which long seemed rather isolated, has witnessed the

appearance of entirely unexpected new applications in recent decades, ranging from Galois theory to quantum gravity models, and has become a kind of a focus of a vast field of research. The book provides an accessible introduction to this new domain, including such topics as coverings of Riemann surfaces, the Galois group action on embedded graphs (Grothendieck's theory of "dessins d'enfants"), the matrix integral method, moduli spaces of curves, the topology of meromorphic functions, and combinatorial aspects of Vassiliev's knot invariants and, in an appendix by Don Zagier, the use of finite group representation theory. The presentation is concrete throughout, with numerous figures, examples (including computer calculations) and exercises, and should appeal to both graduate students and researchers.

Progress in Analysis International Society for Analysis, Applications, and Computation. Congress 2003-01-01 The biannual ISAAC congresses provide information about recent

progress in the whole area of analysis including applications and computation. This book constitutes the proceedings of the third meeting. Contents: .: Volume 1: Function Spaces and Fractional Calculus (V I Burenkov & S Samko); Asymptotic Decomposition (Methods of Small Parameters, Averaging Theory) (J A Dubinski); Integral Transforms and Applications (S Saitoh et al.); Analytic Functionals, Hyperfunctions and Generalized Functions (M Morimoto & H Komatsu); Geometric Function Theory (G Kohr & M Kohr); Complex Function Spaces (R Aulaskari & I Laine); Value Distribution Theory and Complex Dynamics (C C Yang); Clifford Analysis (K Grlebeck et al.); Octonions (T Dray & C Monogue); Nonlinear Potential Theory (O Martio); Classical and Fine Potential Theory, Holomorphic and Finely Holomorphic Functions (P Tamrazov); Differential Geometry and Control Theory for PDEs (B Gulliver et al.); Differential Geometry and Quantum Physics (-); Dynamical Systems (B Fiedler); Attractors for Partial Differential

Equations (G Raugel); Spectral Theory of Differential Operators (B Vainberg); Pseudodifferential Operators, Quantization and Signal Analysis (M W Wong); Microlocal Analysis (B-W Schulze & M Korey); Volume 2: Complex and Functional Analytic Methods in PDEs (A Cialdea et al.); Geometric Properties of Solutions of PDEs (R Magnanini); Qualitative Properties of Solutions of Hyperbolic and Schrödinger Equations (M Reissig & K Yagdjian); Homogenization Moving Boundaries and Porous Media (A Bourgeat & R P Gilbert); Constructive Methods in Applied Problems (P Krutitskii); Waves in Complex Media (R P Gilbert & A Wirgin); Nonlinear Waves (I Lasiecka & H Koch); Mathematical Analysis of Problems in Solid Mechanics (K Hackl & X Li); Direct and Inverse Scattering (L Fishman); Inverse Problems (G N Makrakis et al.); Mathematical Methods in Non-Destructive Evaluation and Non-Destructive Testing (A Wirgin); Numerical Methods for PDEs, Systems and Optimization (A Ben-Israel & I

Herrera). Readership: Graduate students and researchers in real, complex, numerical analysis, as well as mathematical physics."

Complex Analysis I A.A. Gonchar 2013-11-11 A two-part volume containing a comprehensive description of the theory of entire and meromorphic functions of one complex variable and its applications, and a detailed review of recent investigations concerning the function-theoretical peculiarities of polyanalytic functions (boundary behaviour, value distributions, degeneration, uniqueness etc).

Condenser Capacities and Symmetrization in Geometric Function Theory

Vladimir N. Dubinin 2014-08-20 This is the first systematic presentation of the capacity approach and symmetrization in the context of complex analysis. The content of the book is original – the main part has not been covered by existing textbooks and monographs. After an introduction to the theory of condenser capacities in the plane, the monotonicity of the capacity under

various special transformations (polarization, Gonchar transformation, averaging transformations and others) is established, followed by various types of symmetrization which are one of the main objects of the book. By using symmetrization principles, some metric properties of compact sets are obtained and some extremal decomposition problems are solved. Moreover, the classical and present facts for univalent and multivalent meromorphic functions are proven. This book will be a valuable source for current and future researchers in various branches of complex analysis and potential theory.

Value Distribution Theory and Related Topics

Grigor A. Barsegian 2006-05-02 The Nevanlinna theory of value distribution of meromorphic functions, one of the milestones of complex analysis during the last century, was created to extend the classical results concerning the distribution of entire functions to the more general setting of meromorphic functions. Later

on, a similar reasoning has been applied to algebroid functions, subharmonic functions and meromorphic functions on Riemann surfaces as well as to analytic functions of several complex variables, holomorphic and meromorphic mappings and to the theory of minimal surfaces. Moreover, several applications of the theory have been exploited, including complex differential and functional equations, complex dynamics and Diophantine equations. The main emphasis of this collection is to direct attention to a number of recently developed novel ideas and generalizations that relate to the development of value distribution theory and its applications. In particular, we mean a recent theory that replaces the conventional consideration of counting within a disc by an analysis of their geometric locations. Another such example is presented by the generalizations of the second main theorem to higher dimensional cases by using the jet theory. Moreover, similar ideas apparently may be applied to several related areas as well, such as to partial

differential equations and to differential geometry. Indeed, most of these applications go back to the problem of analyzing zeros of certain complex or real functions, meaning in fact to investigate level sets or level surfaces.

Meromorphic Functions over Non-Archimedean Fields Pei-Chu Hu 2012-12-06

Nevanlinna theory (or value distribution theory) in complex analysis is so beautiful that one would naturally be interested in determining how such a theory would look in the non Archimedean analysis and Diophantine approximations. There are two "main theorems" and defect relations that occupy a central place in Nevanlinna theory. They generate a lot of applications in studying uniqueness of meromorphic functions, global solutions of differential equations, dynamics, and so on. In this book, we will introduce non-Archimedean analogues of Nevanlinna theory and its applications. In value distribution theory, the main problem is that given a holomorphic curve $f : C \rightarrow M$ into a

projective variety M of dimension n and a family \mathcal{O}_1 of hypersurfaces on M , under a proper condition of non-degeneracy on f , find the defect relation. If \mathcal{O}_1 is a family of hyperplanes on $M = \mathbb{P}^n$ in general position and if the smallest dimension of linear subspaces containing the image $f(C)$ is k , Cartan conjectured that the bound of defect relation is $2n - k + 1$. Generally, if \mathcal{O}_1 is a family of admissible or normal crossings hypersurfaces, there are respectively Shiffman's conjecture and Griffiths-Lang's conjecture. Here we list the process of this problem: A. Complex analysis: (i) Constant targets: R. Nevanlinna[98] for $n = k = 1$; H. Cartan [20] for $n = k > 1$; E. I. Nochka [99], [100],[101] for $n > k \sim 1$; Shiffman's conjecture partially solved by Hu-Yang [71]; Griffiths-Lang's conjecture (open). *Analytic Functions* Lars Valerian Ahlfors 2015-12-08 A survey of recent developments both in the classical and modern fields of the theory. Contents include: The complex analytic structure of the space of closed Riemann

surfaces; Complex analysis on noncompact Riemann domains; Proof of the Teichmüller-Ahlfors theorem; The conformal mapping of Riemann surfaces; On certain coefficients of univalent functions; Compact analytic surfaces; On differentiable mappings; Deformations of complex analytic manifolds. Originally published in 1960. The Princeton Legacy Library uses the latest print-on-demand technology to again make available previously out-of-print books from the distinguished backlist of Princeton University Press. These editions preserve the original texts of these important books while presenting them in durable paperback and hardcover editions. The goal of the Princeton Legacy Library is to vastly increase access to the rich scholarly heritage found in the thousands of books published by Princeton University Press since its founding in 1905.

Hypercomplex Analysis Irene Sabadini
2009-04-21 Contains selected papers from the ISAAC conference 2007 and invited contributions.

This book covers various topics that represent the main streams of research in hypercomplex analysis as well as the expository articles. It is suitable for researchers and postgraduate students in various areas of mathematical analysis.

Analytic Function Theory Einar Hille 2005-03-23

This famous work is a textbook that emphasizes the conceptual and historical continuity of analytic function theory. The second volume broadens from a textbook to a textbook-treatise, covering the 'canonical' topics (including elliptic functions, entire and meromorphic functions, as well as conformal mapping, etc.) and other topics nearer the expanding frontier of analytic function theory. In the latter category are the chapters on majorization and on functions holomorphic in a half-plane.

Recent Developments in Complex Analysis and Computer Algebra R.P. Gilbert 2013-12-01

This volume consists of papers presented in the special sessions on "Complex and Numerical

Analysis", "Value Distribution Theory and Complex Domains", and "Use of Symbolic Computation in Mathematics Education" of the ISAAC'97 Congress held at the University of Delaware, during June 2-7, 1997. The ISAAC Congress coincided with a U.S.-Japan Seminar also held at the University of Delaware. The latter was supported by the National Science Foundation through Grant INT-9603029 and the Japan Society for the Promotion of Science through Grant MTCS-134. It was natural that the participants of both meetings should interact and consequently several persons attending the Congress also presented papers in the Seminar. The success of the ISAAC Congress and the U.S.-Japan Seminar has led to the ISAAC'99 Congress being held in Fukuoka, Japan during August 1999. Many of the same participants will return to this Seminar. Indeed, it appears that the spirit of the U.S.-Japan Seminar will be continued every second year as part of the ISAAC Congresses. We decided to include with the papers presented in

the ISAAC Congress and the U.S.-Japan Seminar several very good papers by colleagues from the former Soviet Union. These participants in the ISAAC Congress attended at their own expense. Mathematical Analysis during the 20th Century
Jean-Paul Pier 2001-07-05 For several centuries, analysis has been one of the most prestigious and important subjects in mathematics. The present book sets off by tracing the evolution of mathematical analysis, and then endeavours to understand the developments of main trends, problems, and conjectures. It features chapters on general topology, 'classical' integration and measure theory, functional analysis, harmonic analysis and Lie groups, theory of functions and analytic geometry, differential and partial differential equations, topological and differential geometry. The ubiquitous presence of analysis also requires the consideration of related topics such as probability theory or algebraic geometry. Each chapter features a comprehensive first part on developments during the period 1900-1950,

and then provides outlooks on representative achievements during the later part of the century. The book provides many original quotations from outstanding mathematicians as well as an extensive bibliography of the seminal publications. It will be an interesting and useful reference work for graduate students, lecturers, and all professional mathematicians and other scientists with an interest in the history of mathematics.

Advanced Complex Analysis: A Comprehensive Course in Analysis, Part 2B

Barry Simon 2015-11-02 A Comprehensive Course in Analysis by Poincaré Prize winner Barry Simon is a five-volume set that can serve as a graduate-level analysis textbook with a lot of additional bonus information, including hundreds of problems and numerous notes that extend the text and provide important historical background. Depth and breadth of exposition make this set a valuable reference source for almost all areas of classical analysis. Part 2B provides a

comprehensive look at a number of subjects of complex analysis not included in Part 2A. Presented in this volume are the theory of conformal metrics (including the Poincaré metric, the Ahlfors-Robinson proof of Picard's theorem, and Bell's proof of the Painlevé smoothness theorem), topics in analytic number theory (including Jacobi's two- and four-square theorems, the Dirichlet prime progression theorem, the prime number theorem, and the Hardy-Littlewood asymptotics for the number of partitions), the theory of Fuchsian differential equations, asymptotic methods (including Euler's method, stationary phase, the saddle-point method, and the WKB method), univalent functions (including an introduction to SLE), and Nevanlinna theory. The chapters on Fuchsian differential equations and on asymptotic methods can be viewed as a minicourse on the theory of special functions.

Encyclopedic Dictionary of Mathematics
Mathematical Society of Japan 1993 V.1. A.N. v.2.

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O.Z. Appendices and indexes.

Complex Proofs of Real Theorems Peter D.

Lax 2011-12-21 Complex Proofs of Real Theorems is an extended meditation on Hadamard's famous dictum, "The shortest and best way between two truths of the real domain often passes through the imaginary one."

Directed at an audience acquainted with analysis at the first year graduate level, it aims at illustrating how complex variables can be used to provide quick and efficient proofs of a wide variety of important results in such areas of analysis as approximation theory, operator theory, harmonic analysis, and complex dynamics. Topics discussed include weighted approximation on the line, Muntz's theorem, Toeplitz operators, Beurling's theorem on the invariant spaces of the shift operator, prediction theory, the Riesz convexity theorem, the Paley-Wiener theorem, the Titchmarsh convolution theorem, the Gleason-Kahane-Zelazko theorem, and the Fatou-Julia-Baker theorem. The

discussion begins with the world's shortest proof of the fundamental theorem of algebra and concludes with Newman's almost effortless proof of the prime number theorem. Four brief appendices provide all necessary background in complex analysis beyond the standard first year graduate course. Lovers of analysis and beautiful proofs will read and reread this slim volume with pleasure and profit.

Entire Holomorphic Mappings in One and Several Complex Variables. (AM-85), Volume 85

Phillip A. Griffiths 2016-03-02 The present monograph grew out of the fifth set of Hermann Weyl Lectures, given by Professor Griffiths at the Institute for Advanced Study, Princeton, in fall 1974. In Chapter 1 the author discusses Emile Borel's proof and the classical Jensen theorem, order of growth of entire analytic sets, order functions for entire holomorphic mappings, classical indicators of orders of growth, and entire functions and varieties of finite order. Chapter 2 is devoted to

the appearance of curvature, and Chapter 3 considers the defect relations. The author considers the lemma on the logarithmic derivative, R. Nevanlinna's proof of the defect relation, and refinements of the classical case. Algebraic Curves and Riemann Surfaces Rick Miranda 1995 The book was easy to understand, with many examples. The exercises were well chosen, and served to give further examples and developments of the theory. --William Goldman, University of Maryland In this book, Miranda takes the approach that algebraic curves are best encountered for the first time over the complex numbers, where the reader's classical intuition about surfaces, integration, and other concepts can be brought into play. Therefore, many examples of algebraic curves are presented in the first chapters. In this way, the book begins as a primer on Riemann surfaces, with complex charts and meromorphic functions taking center stage. But the main examples come from projective curves, and slowly but

surely the text moves toward the algebraic category. Proofs of the Riemann-Roch and Serre Duality Theorems are presented in an algebraic manner, via an adaptation of the adelic proof, expressed completely in terms of solving a Mittag-Leffler problem. Sheaves and cohomology are introduced as a unifying device in the latter chapters, so that their utility and naturalness are immediately obvious. Requiring a background of one semester of complex variable theory and a year of abstract algebra, this is an excellent graduate textbook for a second-semester course in complex variables or a year-long course in algebraic geometry.

Complex Analysis and Algebraic Geometry

Hans Grauert 2006-11-14

Meromorphic Functions and Analytic Curves.

(AM-12) Hermann Weyl 2016-03-02 The description for this book, Meromorphic Functions and Analytic Curves. (AM-12), will be forthcoming.

Entire Holomorphic Mappings in One and Several

Complex Variables Phillip Griffiths 1976-02-21

The present monograph grew out of the fifth set of Hermann Weyl Lectures, given by Professor Griffiths at the Institute for Advanced Study, Princeton, in fall 1974. In Chapter 1 the author discusses Emile Borel's proof and the classical Jensen theorem, order of growth of entire analytic sets, order functions for entire holomorphic mappings, classical indicators of orders of growth, and entire functions and varieties of finite order. Chapter 2 is devoted to the appearance of curvature, and Chapter 3 considers the defect relations. The author considers the lemma on the logarithmic derivative, R. Nevanlinna's proof of the defect relation, and refinements of the classical case.

Meromorphic Functions and Analytic Curves

Hermann Weyl 1965

Value Distribution Theory L. Sario 2013-03-09

The purpose of this research monograph is to build up a modern value distribution theory for complex analytic mappings between abstract

Riemann surfaces. All results presented herein are new in that, apart from the classical background material in the last chapter, there is no overlapping with any existing monograph on meromorphic functions. Broadly speaking the division of the book is as follows: The Introduction and Chapters I to III deal mainly with the theory of mappings of arbitrary Riemann surfaces as developed by the first named author; Chapter IV, due to Nakai, is devoted to meromorphic functions on parabolic surfaces; Chapter V contains Matsumoto's results on Picard sets; Chapter VI, pre dominantly due to the second named author, presents the so-called nonintegrated forms of the main theorems and includes some joint work by both authors. For a complete list of writers whose results have been discussed we refer to the Author Index.

Contributions to the Theory of Riemann Surfaces

Lars Valerian Ahlfors 1953-08-21 The description for this book, Contributions to the Theory of Riemann Surfaces. (AM-30), Volume 30, will be

forthcoming.

Meromorphic Functions and Analytic Curves, by Hermann Weyl in Collaboration with F. Joachim Weyl. Princeton, Princeton University Press, 1943 Hermann Weyl 1965

Meromorphic Functions and Projective Curves Kichoon Yang 2013-11-27 This book contains an exposition of the theory of meromorphic functions and linear series on a compact Riemann surface. Thus the main subject matter consists of holomorphic maps from a compact Riemann surface to complex projective space. Our emphasis is on families of meromorphic functions and holomorphic curves. Our approach is more geometric than algebraic along the lines of [Griffiths-Harris]. Also, we have relied on the books [Namba] and [Arbarello-Cornalba-Griffiths-Harris] to a great extent. Nearly every result in Chapters 1 through 4 can be found in the union of these two books. Our primary motivation was to understand the totality of meromorphic functions on an algebraic curve.

Though this is a classical subject and much is known about meromorphic functions, we felt that an accessible exposition was lacking in the current literature. Thus our book can be thought of as a modest effort to expose parts of the known theory of meromorphic functions and holomorphic curves with a geometric bent. We have tried to make the book self-contained and concise which meant that several major proofs not essential to further development of the theory had to be omitted. The book is targeted at the non-expert who wishes to learn enough about meromorphic functions and holomorphic curves so that he/she will be able to apply the results in his/her own research. For example, a differential geometer working in minimal surface theory may want to find out more about the distribution pattern of poles and zeros of a meromorphic function.

Several Complex Variables and Complex Geometry Eric Bedford 1991

Kunihiko Kodaira, Volume I Kunihiko Kodaira

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2015-03-08 Kunihiro Kodaira's influence in mathematics has been fundamental and international, and his efforts have helped lay the foundations of modern complex analysis. These three volumes contain Kodaira's written contributions, published in a large number of journals and books between 1937 and 1971. The volumes cover chronologically the major periods of Kodaira's mathematical concentration and reflect his collaboration with other prominent theoreticians. Thus they begin with early works that discuss the application of Hilbert space methods to differential equations, and the use of elementary solutions to prove regularity theorems for strongly elliptic systems of partial differential equations. Originally published in 1975. The Princeton Legacy Library uses the latest print-on-demand technology to again make available previously out-of-print books from the distinguished backlist of Princeton University Press. These editions preserve the original texts of these important books while presenting them

in durable paperback and hardcover editions. The goal of the Princeton Legacy Library is to vastly increase access to the rich scholarly heritage found in the thousands of books published by Princeton University Press since its founding in 1905.

Nevanlinna Theory in Several Complex Variables and Diophantine Approximation Junjiro Noguchi

2013-12-09 The aim of this book is to provide a comprehensive account of higher dimensional Nevanlinna theory and its relations with Diophantine approximation theory for graduate students and interested researchers. This book with nine chapters systematically describes Nevanlinna theory of meromorphic maps between algebraic varieties or complex spaces, building up from the classical theory of meromorphic functions on the complex plane with full proofs in Chap. 1 to the current state of research. Chapter 2 presents the First Main Theorem for coherent ideal sheaves in a very general form. With the preparation of

plurisubharmonic functions, how the theory to be generalized in a higher dimension is described. In Chap. 3 the Second Main Theorem for differentially non-degenerate meromorphic maps by Griffiths and others is proved as a prototype of higher dimensional Nevanlinna theory. Establishing such a Second Main Theorem for entire curves in general complex algebraic varieties is a wide-open problem. In Chap. 4, the Cartan-Nochka Second Main Theorem in the linear projective case and the Logarithmic Bloch-Ochiai Theorem in the case of general algebraic varieties are proved. Then the theory of entire curves in semi-abelian varieties, including the Second Main Theorem of Noguchi-Winkelmann-Yamanoi, is dealt with in full details in Chap. 6. For that purpose Chap. 5 is devoted to the notion of semi-abelian varieties. The result leads to a number of applications. With these results, the Kobayashi hyperbolicity problems are discussed in Chap. 7. In the last two chapters Diophantine approximation theory is dealt with from the

viewpoint of higher dimensional Nevanlinna theory, and the Lang-Vojta conjecture is confirmed in some cases. In Chap. 8 the theory over function fields is discussed. Finally, in Chap. 9, the theorems of Roth, Schmidt, Faltings, and Vojta over number fields are presented and formulated in view of Nevanlinna theory with results motivated by those in Chaps. 4, 6, and 7. [Handbook of Elliptic and Hyperelliptic Curve Cryptography](#) Henri Cohen 2005-07-19 The discrete logarithm problem based on elliptic and hyperelliptic curves has gained a lot of popularity as a cryptographic primitive. The main reason is that no subexponential algorithm for computing discrete logarithms on small genus curves is currently available, except in very special cases. Therefore curve-based cryptosystems require much smaller key sizes than RSA to attain the same security level. This makes them particularly attractive for implementations on memory-restricted devices like smart cards and in high-security applications. The Handbook of Elliptic

and Hyperelliptic Curve Cryptography introduces the theory and algorithms involved in curve-based cryptography. After a very detailed exposition of the mathematical background, it provides ready-to-implement algorithms for the group operations and computation of pairings. It explores methods for point counting and constructing curves with the complex multiplication method and provides the algorithms in an explicit manner. It also surveys generic methods to compute discrete logarithms and details index calculus methods for hyperelliptic curves. For some special curves the discrete logarithm problem can be transferred to an easier one; the consequences are explained and suggestions for good choices are given. The authors present applications to protocols for discrete-logarithm-based systems (including bilinear structures) and explain the use of elliptic and hyperelliptic curves in factorization and primality proving. Two chapters explore their design and efficient implementations in smart

cards. Practical and theoretical aspects of side-channel attacks and countermeasures and a chapter devoted to (pseudo-)random number generation round off the exposition. The broad coverage of all-important areas makes this book a complete handbook of elliptic and hyperelliptic curve cryptography and an invaluable reference to anyone interested in this exciting field.

Progress In Analysis, Proceedings Of The 3rd Isaac Congress (In 2 Volumes) Heinrich G W

Begehr 2003-08-04 The biannual ISAAC congresses provide information about recent progress in the whole area of analysis including applications and computation. This book constitutes the proceedings of the third meeting.

Patching on Berkovich Spaces and the Local-Global Principle Vlere Mehmeti 2019

Field patching, introduced by Harbater and Hartmann, and extended by the aforementioned authors and Krashen, has recently seen numerous applications. We present an extension of this technique to the setting of Berkovich

analytic geometry and applications to the local-global principle. In particular, we show that this adaptation of patching can be applied to Berkovich analytic curves, and as a consequence obtain local-global principles over function fields of curves defined over complete ultrametric fields. Because of the connection between the points of a Berkovich analytic curve and the valuations that its function field can be endowed with, one of these local-global principles is given with respect to completions, thus evoking some similarity with more classical versions. As an application, we obtain local-global principles for quadratic forms and results on the u -invariant. These findings generalize those of Harbater, Hartmann and Krashen. As a starting point for higher-dimensional patching in the Berkovich setting, we show that this technique is applicable around certain fibers of a relative Berkovich analytic curve. As a consequence, we prove a local-global principle over the germs of meromorphic functions on said fibers. By showing

that said germs of meromorphic functions are algebraic, we also obtain local-global principles over function fields of algebraic curves defined over a larger class of ultrametric fields.

Selecta Donald Clayton Spencer 1985
Value Distribution of Meromorphic

Functions Jianhua Zheng 2011-03-31 "Value Distribution of Meromorphic Functions" focuses on functions meromorphic in an angle or on the complex plane, T directions, deficient values, singular values, potential theory in value distribution and the proof of the celebrated Nevanlinna conjecture. The book introduces various characteristics of meromorphic functions and their connections, several aspects of new singular directions, new results on estimates of the number of deficient values, new results on singular values and behaviours of subharmonic functions which are the foundation for further discussion on the proof of the Nevanlinna conjecture. The independent significance of normality of subharmonic function family is

emphasized. This book is designed for scientists, engineers and post graduated students engaged in Complex Analysis and Meromorphic Functions. Dr. Jianhua Zheng is a Professor at the Department of Mathematical Sciences, Tsinghua University, China.

Value Distribution of Meromorphic

Functions Anatoliĭ Asirovich Gol'dberg This book contains a comprehensive exposition of the Nevanlinna theory of meromorphic functions of one complex variable, with detailed study of deficiencies, value distribution, and asymptotic properties of meromorphic functions. A self-contained exposition of the inverse problem for meromorphic functions of finite order with finitely many deficiencies is given in full detail. Many results included in the book belong to the authors, and were previously available only in journal articles. The main body of the book is a translation of the Russian original published in 1970, which has been one of the most popular sources in this field since then. New references

and footnotes related to recent achievements in the topics considered in the original edition have been added and a few corrections made. A new Appendix with a survey of the results obtained after 1970 and extensive bibliography has been written by Alexandre Eremenko and James K. Langley for this English edition. The only prerequisite for understanding material of this book is an undergraduate course in the theory of functions of one complex variable.

Hermann Weyl's Raum - Zeit - Materie and a General Introduction to His Scientific Work

Erhard Scholz 2012-12-06 Historical interest and studies of Weyl's role in the interplay between 20th-century mathematics, physics and philosophy have been increasing since the middle 1980s, triggered by different activities at the occasion of the centenary of his birth in 1985, and are far from being exhausted. The present book takes Weyl's "Raum - Zeit - Materie" (Space - Time - Matter) as center of concentration and starting field for a broader look at his work. The

contributions in the first part of this volume discuss Weyl's deep involvement in relativity, cosmology and matter theories between the classical unified field theories and quantum physics from the perspective of a creative mind struggling against theories of nature restricted by the view of classical determinism. In the second part of this volume, a broad and detailed introduction is given to Weyl's work in the mathematical sciences in general and in philosophy. It covers the whole range of Weyl's mathematical and physical interests: real analysis, complex function theory and Riemann surfaces, elementary ergodic theory, foundations of mathematics, differential geometry, general relativity, Lie groups, quantum mechanics, and number theory.

Advances in Complex Analysis and Applications

Francisco Bulnes 2020-11-04 The complex analysis, also known as theory of analytic functions or complex variable function theory, is the part of mathematical analysis that

investigates the functions of complex numbers, their analyticity, holomorphicity, and integration of these functions on complex domains that can be complex manifolds or submanifolds. Also the extensions of these domains to the complex projective spaces and complex topological groups are study themes. The analytic continuing of complex domains where complex series representations are used and the exploring of singularities whose integration invariants obtain values as zeros of certain polynomials of the complex rings of certain vector bundles are important in the exploring of new function classes in the meromorphic context and also arithmetic context. Also important are established correspondences with complex vector spaces, or even in their real parts, using several techniques of complex geometrical analysis, Nevanlinna methods, and other techniques as the modular forms. All this is just some examples of great abundance of the problems in mathematics research that require

the complex analysis application. This book covers some interesting and original research of certain topics of complex analysis. Also included are some applications for inverse and ill posed problems developed in engineering and applied research.

Nevanlinna Theory, Normal Families, and Algebraic Differential Equations

Norbert Steinmetz 2017-07-24 This book offers a modern introduction to Nevanlinna theory and its intricate relation to the theory of normal families, algebraic functions, asymptotic series, and algebraic differential equations. Following a comprehensive treatment of Nevanlinna's theory of value distribution, the author presents advances made since Hayman's work on the value distribution of differential polynomials and illustrates how value- and pair-sharing problems are linked to algebraic curves and Briot-Bouquet differential equations. In addition to discussing classical applications of Nevanlinna theory, the book outlines state-of-the-art research, such as

the effect of the Yosida and Zalcman-Pang method of re-scaling to algebraic differential equations, and presents the Painlevé-Yosida theorem, which relates Painlevé transcendents and solutions to selected 2D Hamiltonian systems to certain Yosida classes of meromorphic functions. Aimed at graduate students interested in recent developments in the field and researchers working on related problems, Nevanlinna Theory, Normal Families, and Algebraic Differential Equations will also be of interest to complex analysts looking for an introduction to various topics in the subject area. With examples, exercises and proofs seamlessly intertwined with the body of the text, this book is particularly suitable for the more advanced reader.

Complex Analysis I A.A. Gonchar 2012-11-30 A two-part volume containing a comprehensive description of the theory of entire and meromorphic functions of one complex variable and its applications, and a detailed review of

recent investigations concerning the function-theoretical peculiarities of polyanalytic functions

(boundary behaviour, value distributions, degeneration, uniqueness etc).